

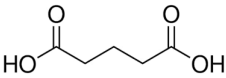
Multiple Choice Answers

Q7: D

Q8: B

Multiple Choice Answers

Q9: B

3(a)	simplest /lowest (whole number / integer) ratio of atoms (of each element) in a compound / molecule
3(b)	two of: 
3(c)(i)	homolytic
3(c)(ii)	M1 $\text{C}_5\text{H}_{10} + \text{Cl}\cdot \rightarrow \text{C}_5\text{H}_9\cdot + \text{HCl}$ M2 $\text{C}_5\text{H}_9\cdot + \text{Cl}_2 \rightarrow \text{C}_5\text{H}_9\text{Cl} + \text{Cl}\cdot$
3(c)(iii)	termination
3(d)(i)	HCl (g)
3(d)(ii)	M1 (reaction 1): $-3115 - 286 + 3292 = -109 \text{ (kJ mol}^{-1}\text{)}$ M2 $\Delta H_2 = -53 - (-109) = (+)56 \text{ (kJ mol}^{-1}\text{)}$
3(e)(i)	
3(e)(ii)	M1 absorption labelled at approx. 3000 cm^{-1} identified as O—H M2 absorption labelled at approx. 1720 cm^{-1} identified as C=O

1(a)	38.87 g																
1(b)	M1 Dissolve the solid / MnSO ₄ .H ₂ O / manganese sulfate (in the beaker) using (a small volume of) distilled water M2 transfer / add to a (100 cm ³ volumetric) flask AND rinse (with distilled water) M3 top up the 100 cm ³ volumetric flask to mark (with distilled water) AND Invert the (stoppered) flask																
1(c)(i)	(wear) chemically resistant gloves.																
1(c)(ii)	dissolving NaOH(s) is (very) exothermic																
1(d)(i)	Oxygen in trapped air could dissolve into the water sample																
1(d)(ii)	(25.0 cm ³) volumetric pipette																
1(d)(iii)	To observe the end-point more clearly																
1(e)(i)	M1 <table border="1"><tr><td>rough</td><td>1</td><td>2</td><td>3</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td>12.70</td><td>13.05</td><td>13.15</td></tr></table> M2 13.10 cm ³	rough	1	2	3										12.70	13.05	13.15
rough	1	2	3														
	12.70	13.05	13.15														
1(e)(ii)	titrations 2 and 3 are within 0.10 cm ³ of each other																
1(e)(iii)	working must be shown $\frac{2 \times 0.05}{13.15} \times 100 = 0.760$																
1(f)(i)	(e)(i) / (2 × 10 ⁶) = 6.55 × 10 ⁻⁶ (mol)																
1(f)(ii)	(f)(i) × 10 = 6.55 × 10 ⁻⁵ (mol)																
1(f)(iii)	(f)(ii) × 1.28 × 10 ⁵ = 8.38 (mg dm ⁻³)																